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An Electrical Stimulus Which Can Be Accurately Measured

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The increase and decrease of resistance to the unexpected blow on the back of the free swinging hand, as revealed by our data, seems to be explicable only on the physiological concept of muscular tonus, that the increase and decrease of resistance is indicative of increase and decrease of muscular tonus.

STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

AN ELECTRICAL STIMULUS WHICH CAN BE ACCURATELY MEASURED

THOMAS H. HOWELLS

The difficulty encountered in the past with any technique involving the use of an electrical stimulus has been that of obtaining a stimulating current which could at once be easily varied and accurately measured. In order to make it possible to vary the necessarily high voltage involved, an induction coil or transformer was usually used as the source of electrical current. Since these instruments have an alternating current output it is therefore difficult to obtain a meter capable of measuring the very small current that can be used as a stimulant. The ordinary A. C. meters are not adapted for measurement of very weak currents. In lieu of current measurement it has been customary to measure the applied E.M.F. Voltage, however, is an unreliable indicator of the energy put into the stimulus. The uncontrolled factor of variable skin and body resistance effects a corresponding variation in current, which is independent of the applied voltage.

In the procedure of this report the source of electrical energy was the standard 60 cycle lighting current which was obtained from a bell transformer at a potential of 12 volts. This was passed through a rheostat having a range of from 0 to 600 ohms, and from thence through the primary of a step-up transformer. The normal output of this instrument was 50 milliamperes at 20,000 volts. This output could be diminished to any desirable value by means of the control resistance in series with the primary. The A. C. output of this transformer was now passed through from the plate to the filament of a radio vacuum tube of the five watt type which is used for transmitting. Thus the alternating current was converted into a pulsating direct current which could be varied gradually over a wide range by means of the control resistance in series with the primary of the transformer. This direct current

was very easily and accurately measured by means of a D'Arsonval galvanometer.

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A STUDY OF THE UNSUCCESSFUL COLLEGE STUDENT

E. O. FINKENBINDER

This study attempts to discover (1) by the use of tests, *the student's mental ability*, (2) by observation of him at work, *the type of procedure he employs in his study*, (3) by the analysis of his daily routine, *his economy of energy expended*, and (4) by the analysis of his college grades in comparison with his ability, *which subjects are most successfully carried by him, best fitted to his type of mentality and habits of study*.

A study of the students who do not reach the scholastic standard of success required for them to remain in school shows that their median score of ability in mental tests is just about equal to the 20-percentile mark of the entire student body. Their scores fall among the lower two-fifths of all scores. Among 71 who dropped out of school or were dropped during the past term, only two students had scores on the Otis (Self-Administering) test as high as the medium of all,—41. Low scores were 19, 17, 14, 10 such as are attained by 10-year old children. Obviously, the state and the individual are both to be losers in trying to do college work with such meagre resources.

These students could not follow directions closely enough to prepare a lesson from an assignment given them. Some of them failed to follow even a single one of 15 directions given in a test; and although the first problem was answered for them, they succeeded in giving an erroneous answer to it. For example, a row of digits, from one consecutively through nine, was laid before them and they were directed to write the number which is the sum of the smallest two odd numbers. They were instructed, further, that the correct answer is 4; but they wrote a 2 or some other number equally unique as an answer to the problem given them.

Not only are these students short in following the sequence of ideas, but they fall short in stock of ideas they need to employ in doing the college day's work, as was shown in their paucity of general information and words. The tests on these two items revealed that they were not equipped to do college work. Here again